

What is claimed is:

- 1) A heat exchanger system, relating to transferring waste heat from a stream of exhaust air produced in a dryer to a stream of fresh air directed to flow into the dryer, comprising:
  - a) at least one heat transferor structured and arranged to substantially convectively transfer the waste heat to the stream of fresh air,
  - b) wherein said heat transferor comprises at least one array structured and arranged to array substantially vertical, substantially mutually parallel plurality of heat-transfer conduits adapted to internally conduct segregated portions of the stream of exhaust air,
  - c) wherein at least one heat-transfer conduit of said plurality of heat-transfer conduits comprises at least one thermally-conductive conduit wall structured and arranged to conduct heat from the segregated portions of the stream of exhaust air to the stream of fresh air,
  - d) wherein said at least one heat-transfer conduit comprises at least one fluid-dynamic shape for influencing dynamics of the fresh air, and wherein said fluid-dynamic shape comprises at least one substantially square cross-section; and
  - e) at least one structure adapted to maintain at least one structural relationship between said heat transferor and the

dryer.

- 2) The heat exchanger system according to Claim 1, wherein said at least one structure comprises:
  - a) at least one base support plate structured and arranged to support lower ends of said heat transferor;
  - b) at least one top support plate structured and arranged to support upper ends of said heat transferor; and
  - c) at least one interconnector structured and arranged to interconnect at least two of said heat transferor, said at least one base support plate, said at least one top support plate, and the dryer.
- 3) The heat exchanger system according to Claim 1, wherein said at least one fluid-dynamic shape further comprises at least one heat-transfer conduit oriented to have one corner of said square cross-section facing the general direction of flow of the stream of fresh air through said heat transferor.
- 4) The heat exchanger system according to Claim 1, wherein said at least one array comprises staggered alternating rows.
- 5) The heat exchanger system according to Claim 1, wherein said at least one array has at least one dimensional relationship comprising:
  - a) external side width of said at least one square cross section of said at least one heat-transfer conduit; and
  - b) uniform side-to-side spacing apart of said plurality of said

heat-transfer conduits of about one-half of said external side width of said at least one square cross section of said at least one heat-transfer conduit.

- 6) The heat exchanger system according to Claim 5, wherein said external side width is about one-and one-half inches.
- 7) The heat exchanger system according to Claim 1, wherein said at least one thermally-conductive conduit wall comprises at least one conduit wall about 0.018" thick.
- 8) The heat exchanger system according to Claim 1, wherein said at least one thermally-conductive conduit wall comprises aluminum.
- 9) The heat exchanger system according to Claim 1, wherein said heat-transferor further comprises at least one side constraint structured and arranged to constrain the flow of the fresh air over said heat-transfer conduits to move between first and second opposing sides of said heat-transferor.
- 10) A heat exchanger system, for transferring waste heat from a stream of exhaust air produced in a dryer to a stream of fresh air directed to flow into the dryer, comprising:
  - a) at least one retriever comprising at least one array of at least one plurality of substantially mutually parallel, substantially vertical heat-transfer conduits having square cross-sections arrayed in alternating staggered rows relative to a perpendicular to the general direction of the

flow of the stream of fresh air into the dryer, wherein each heat-transfer conduit is oriented to have one corner facing in the general direction of the flow of the stream of fresh air into the dryer; and

b) at least one structure adapted to support said at least one array of said at least one plurality of heat-transfer conduits transverse to the flow of the stream of fresh air into the dryer.

11) The heat exchanger system according to Claim 10, further comprising at least one structure for assisting receiving the stream of exhaust air internal to said at least one heat-transfer conduit of said at least one retriever.

12) The heat exchanger system according to Claim 10, further comprising said at least one retriever adapted to be integrated with at least one pre-existing particular dryer, wherein said at least one retriever further comprises said at least one structure integrated with said at least one array of heat-transfer conduits.

13) The heat exchanger system according to Claim 10, further comprising said at least one retriever integrated with at least one particular dryer.

14) A heat exchanger system, relating to transferring waste heat from a stream of exhaust air produced in a dryer to a stream of fresh air directed to flow into the dryer, comprising the

steps of:

- a) pre-configuring, responsive to customer requirements, at least one retriever comprising at least one array of at least one plurality of substantially mutually parallel, substantially vertical heat-transfer conduits having square cross-sections arrayed in alternating staggered rows relative to a perpendicular to the general direction of the flow of the stream of fresh air into the dryer, wherein each heat-transfer conduit is oriented to have one corner facing in the general direction of the flow of the stream of fresh air through said at least one retriever.
- 15) The heat exchanger system according to Claim 14, wherein the step of pre-configuring comprises the step of determining at least one size requirement for said at least one array.
- 16) The heat exchanger system according to Claim 15, wherein the step of pre-configuring comprises the step of perforating at least one plate with at least one pattern of a plurality of square perforations in staggered rows, each square perforation oriented cornerwise to the general direction of flow of the fresh air over said at least one plate, responsive to said at least one size requirement.
- 17) The heat exchanger system according to Claim 16, further comprising the step of attaching said plurality of heat transfer conduits to said at least one plate, wherein each

said heat transfer conduit of said plurality of heat transfer conduits is aligned and oriented to one perforation of said plurality of perforations.

- 18) The heat exchanger system according to Claim 14, further comprising the step of attaching structural elements to at least said at least one plate, wherein said structural elements are structured and arranged to at least maintain structural integrity of said retriever.
- 19) The heat exchanger system according to Claim 14, further comprising the step of installing said retriever in at least one dryer.
- 20) A heat exchanger system, relating to transferring waste heat from a stream of exhaust air produced in a dryer to a stream of fresh air directed to flow into the dryer, comprising:
  - a) heat transfer means for substantially convectively transferring the waste heat to the stream of fresh air,
  - b) wherein said heat transfer means comprises array means for arraying substantially vertical, substantially parallel heat-transfer conduit means for internally conducting segregated portions of the stream of exhaust air,
  - c) wherein said heat-transfer conduit means comprise thermally-conductive conduit wall means for conducting heat from the segregated portions of the stream of exhaust air to the stream of fresh air,

- d) wherein said heat-transfer conduit means comprises fluid-dynamic means for influencing dynamics of the fresh air, and wherein said fluid-dynamic means comprises heat-transfer conduit means having substantially square cross-sections; and
- e) structure means for structuring a relationship between said heat transfer means and the dryer.